

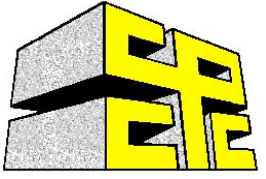
ENERGY MANAGEMENT AT CALIFORNIA PORTLAND CEMENT

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2005 Energy Report Committee -
Climate Change Workshop
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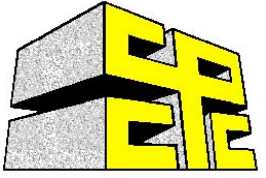


Energy Management at CPC



OVERVIEW

- Company Background
- Energy Program Organization
- Initiatives
- Incentives and Resources
- Results
- Conclusions

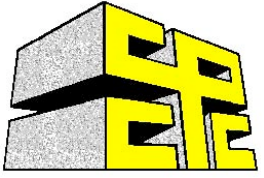


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COMPANY BACKGROUND

- Founded in 1891
- Producer of Cement, Concrete and Aggregates
- Facilities in CA, AZ and NV
- Market area – Southwest US
- Created formal Energy Management Program in 2003



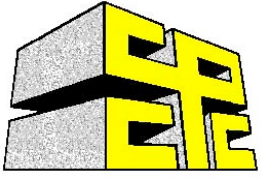
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Energy Program Organization

- Corporate Energy Team
 - Meets every 6 weeks at various plant sites
- Local Energy Teams
 - Meet with plant departments
- Process Energy Team
 - Performs process audits
- Corporate support
 - Sr. VP Operations & VP Engineering attend meetings
- Plant Support
 - Plant Mgrs and plant employees attend meetings



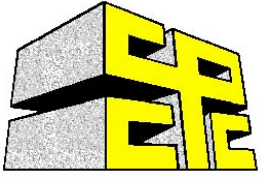


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Initiatives

- Compressed Air
- Process Improvements
- Electrical & Lighting Systems
- Mechanical Systems & Drives
- Plant Operations, Engineering & Maintenance
- Awareness & Training



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Compressed Air

- Compressor Operations
- Compressed Air Conditioning (dryer, filter and after-cooler operation)
- Compressed Air Use
- Compressed Air Leaks

Compressed Air Leaks

Compressed Air Leak Cost		
Hole Diameter [inches]	Leak Rate [scfm]	Leak Cost [\$ /yr]
1/64	0.2	30
1/32	0.9	130
1/16	3.7	500
1/8	10.0	2,000
3/16	30.0	4,500
1/4	60.0	8,000
3/8	130.0	18,000
1/2	230.0	32,100
3/4	360.0	50,000
1	480.0	64,000



UNDERGROUND AIR LEAKS



NEW AIR PIPING



NEW DUST COLLECTOR CONTROLLER



NEW AIR RECEIVER AUTOMATIC DRAIN



AIR LANCE

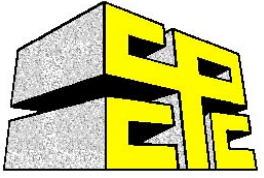


AIR HORN TO COOL MOTOR



NEW COMPRESSOR AFTER-COOLER



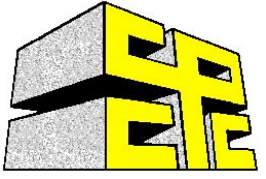


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Process Improvements

- Process Energy Team
- Perform process audits
- Establish baseline operations
- Improve process efficiencies
- Reduce process heat losses
- Optimize chemistry
- Improve quality and process control
- Improve grinding efficiencies
- Develop reports with recommendations



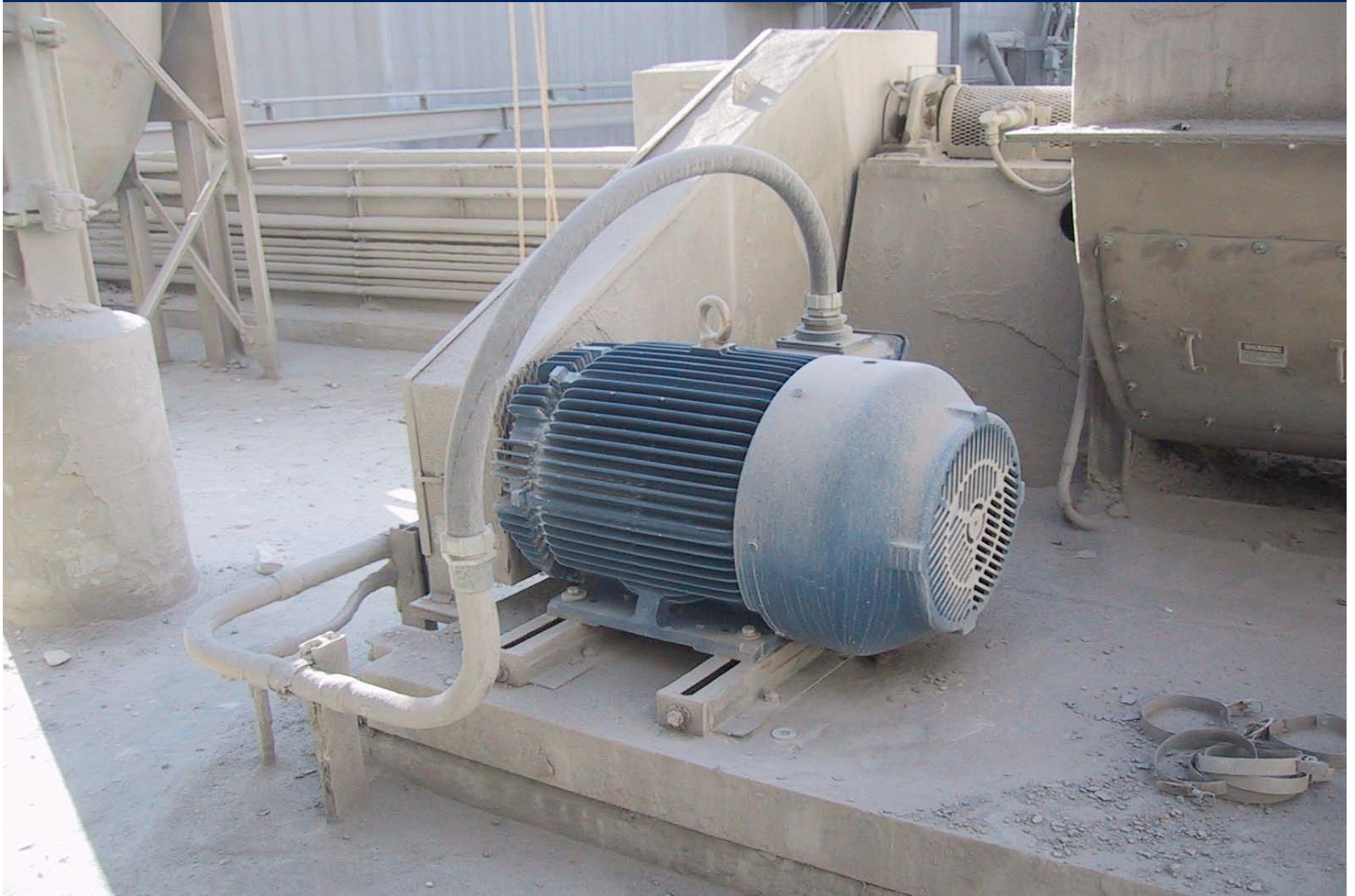
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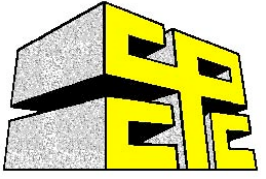


Electrical & Lighting Improvements

- Develop Motor Management Program
- Select proper motor sizes
- Improve power factor and power quality
- Optimize use of variable speed drives
- Improve lighting efficiencies

FREE MOTOR FROM DOE MOTOR STUDY





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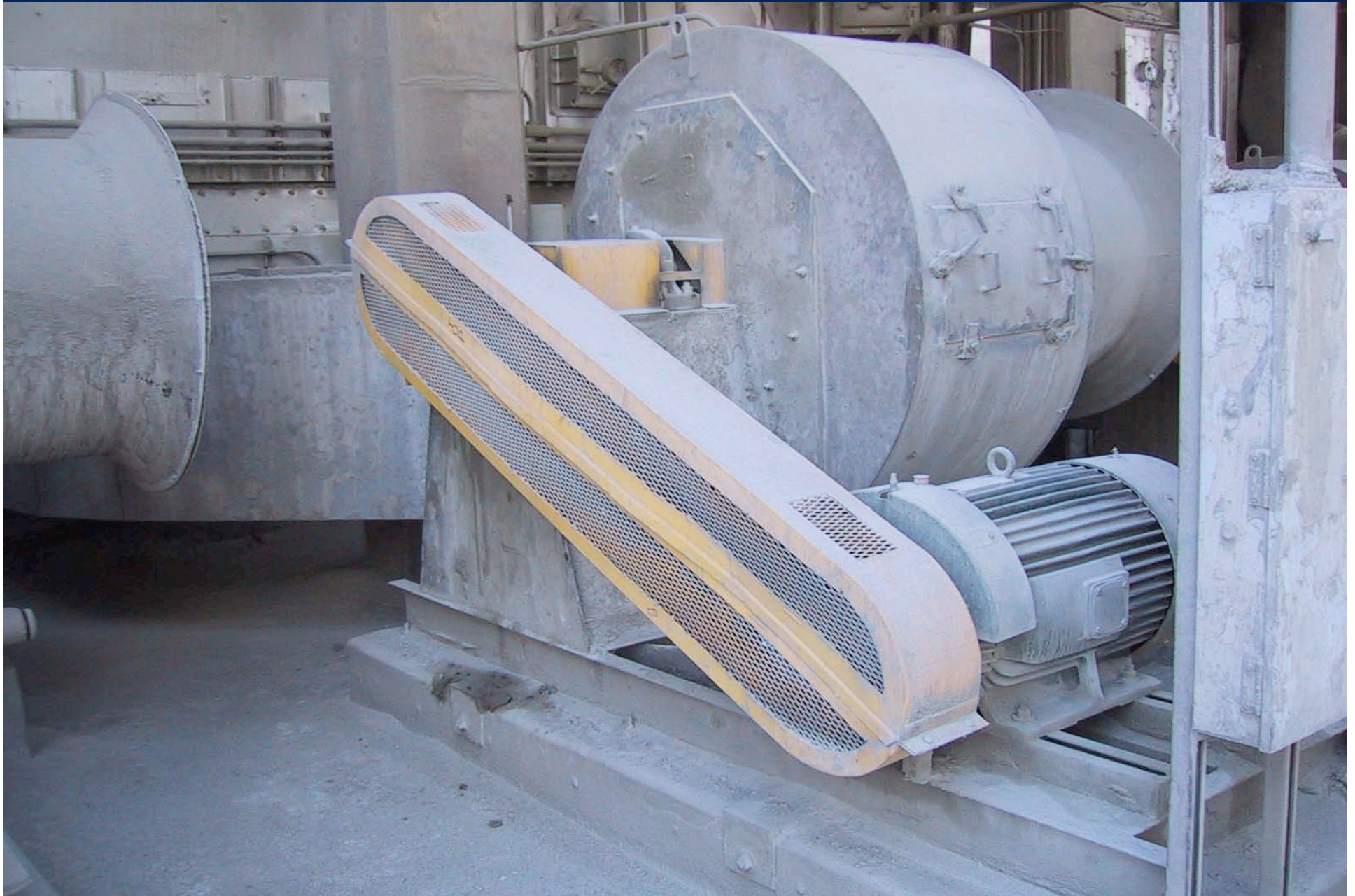


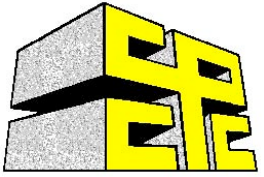
Mechanical Systems & Drives

- Replace V-belts with Cog type belts (3-5% energy efficiency improvement)
- Maximize efficiency of drives
- Optimize HVAC and insulation systems



REPLACED V-BELT WITH COG BELT





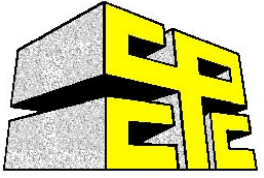
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Engineering, Operations & Maintenance

- Develop energy savings specifications & guidelines
- Reduce equipment operating times
- Improve reliability of equipment
- Track energy savings projects through work order system
- Modify purchasing and inventory control procedures





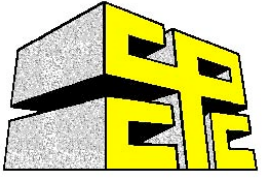
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Awareness & Training

- Provide employee training on energy efficiency
- Communicate policies
- Distribute Energy Meeting Minutes
- Develop signs
- Communicate energy savings successes and tips via email, newsletters, intranet, etc.
- Recognize employees



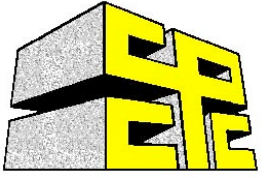


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Incentives & Resources

- EPA Energy Star
 - Cement Industry Focus Group
 - Account Manager
- Utility Rebates
 - Lighting
 - Process Improvement Projects
- Motor Research Project
- DOE Plant-wide Assessment Grant - \$59 K
- DOE Training & Software Programs
- AZ Dept. of Commerce Training



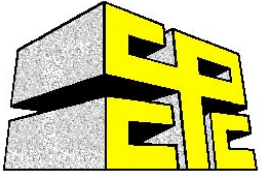
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Results

- Reduced overall energy usage by ~ 3% 2004 vs. 2003
- Reduced CO2 emissions by 27,221,365 pounds in 2004
- Several ongoing energy initiatives firmly in place
- Energy awareness has improved significantly
- Colton Awarded PCA's 2004 Cement Industry Environmental Award – Energy Efficiency
- Rillito Awarded AZ Governor's Award for Excellence in Energy Efficiency



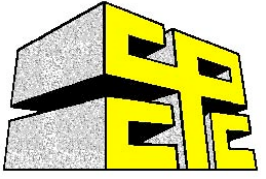


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PARTNER OF THE YEAR 2005





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Conclusions

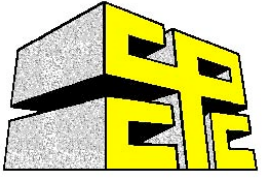
- Program successful in reducing energy consumption and emissions
- Many resources are available: Energy Star, DOE, Utilities, vendors
- Considering financial awards for energy savings ideas
- Great untapped potential

“MANY A MICKLE MAKES A MUCKLE”





I can save **how much** money by conserving energy???



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QUESTIONS?